

## NOTE ON A BLUE MINERAL, SUPPOSED TO BE ULTRAMARINE, FROM SILVER CITY, NEW MEXICO.

By R. L. PACKARD.

SOME TIME ago the newspapers\* mentioned the discovery of ultramarine in New Mexico, and Mr. G. P. Merrill, curator of geology in the U. S. National Museum, who was in Silver City, New Mexico, in the early part of 1892, visited the locality where the blue mineral referred to is found, and noted its occurrence. He states that the mineral occurs in irregular veins and streaks in the limestone carrying the silver ore (chloride) which is mined at Chloride Flat near Silver City. The specimens he procured for the Museum exhibit the earthy blue substance (which, on casual inspection, does somewhat resemble ultramarine) intimately associated with calcite, chalcedonic quartz, and a decomposed ferruginous siliceous material which is permeated with calcite, as is also the blue mineral itself; and grains of calcite can be seen mixed with particles of the latter on crushing and examining it with a microscope.

It was found impossible to free the mineral completely from its associated gangue by the Thonlet's solution, and to obtain as pure material as possible for analysis small particles which were free from visible impurities were carefully picked out, larger ones were crushed and gangue and mineral separated by picking over, the blue fragments being again crushed and picked over. The material so obtained was powdered in an agate mortar, treated with hot dilute hydrochloric acid to dissolve out the calcite and other impurities; the powder was filtered off, washed, and then boiled with a strong solution of carbonate of soda, washed thoroughly, dried at  $110^{\circ}$ , and ground fine for analysis. With every precaution, however, a few scattered grains of a mineral more strongly refracting than the blue one under investigation were observed under the microscope, showing that perfect separation had not been effected. These grains of foreign matter (quartz) are doubtless the cause of the slight differences in the analyses.

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\* *Iron*, London, Jan. 2, 1892: "A New Discovery of Ultramarine."

The material obtained for analysis as above described is dull, earthy, and of a blue color, resembling vivianite in these respects, but is in the form of a powder. Its grains act feebly on polarized light, but present no crystalline forms. It does not lose its color in hot acids although it is partly decomposed, yielding magnesia. Before the blow-pipe it does not color the cold borax bead, becomes white on ignition but does not fuse, and then gives a pink color with cobalt solution. After treatment with HCl it gives no reaction for manganese on fusing with soda. It contains no phosphoric acid or sulphur.

The analyses of different samples varied somewhat for the reasons which have been given above. Three which accord well are as follows:

	I.	II.	III.
Ignition .....	6.47	6.26	.....
SiO <sub>2</sub> .....	62.43	63.19	62.03
MgO .....	28.53	27.22	28.74
FeO .....	.99	.....	.....
Al <sub>2</sub> O <sub>3</sub> .....	.25	.....	.....
Na <sub>2</sub> O .....	.14	.....	.....
K <sub>2</sub> O .....	.16	.....	.....
	98.97		

These analyses show a chemical resemblance to talc, although the physical properties of the two minerals are different. One of the analyses (No. XLVII) given in Hintze's Handbuch, under talc, is almost identical with the above. It runs as follows: SiO<sub>2</sub> 63.95, FeO 0.60, MgO 28.25, H<sub>2</sub>O 6.65, with 0.78 Al<sub>2</sub>O<sub>3</sub>.

The carbonate accompanying the mineral is rich in magnesia which, with the abundant silica and iron oxide, would supply the materials for its composition.